

Bradley Kohler

B.ENG. MECHATRONICS ENGINEERING · 5 YEARS OF PROFESSIONAL WORK EXPERIENCE

Toronto, ON, Canada

✉ bradleykohler96@gmail.com | 📱 bradleykohler96 | 🌐 bradleykohler96

Skills

Programming Languages

BASH
C/C++/C#
Python
Java
HTML/CSS/JavaScript

Machine Learning

PyTorch
TensorFlow
Nvidia CUDA

MCU Firmware

STM32
Nordic
Qualcomm
Simulink

Operating Systems

Linux
AndroidOS
mbedOS
ChibiOS
FreeRTOS

Hardware Design

Verilog HDL
NI Multisim
Eagle

Systems Design

AutoCAD
SolidWorks
Maplesim

Computer Mathematics

Maple18
NumPy
Eigen
MATLAB

Continuous Integration

Docker
TravisCI
CircleCI
Jenkins
Bamboo

Work Experience

STMicroelectronics (STM)

Waterloo, Ontario

WIRELESS SOFTWARE DEVELOPER

Sept. 2021 - Present

- Added new release (36.331 specification V14, 15, 16, and 17) features to the Radio Resource Controller (RRC) layer of an LTE NB-IoT & MTC stack.
- Directed debugging efforts and coordinated communication with stack teams including L1, PDCP, RLC, MAC, and NAS.
- Interpreted 3GPP LTE specifications and translated them to embedded C, leveraging expertise in software architecture for seamless integration.
- Diagnosed and resolved stack issues using Amarisoft and Rohde & Schwarz CMW wireless communication conformance testing equipment.
- Authored innovative tools, such as a Python tool named asngen, which generated a lightweight C translation layer from the 36.331 specification to replace the existing encoder/decoders. It enabled a decrease of read-only data by 148KB (48%) compared to the existing implementation.
- Built and maintained lab machines equip with FPGAs, ASICs, Amarisoft, and Rohde & Schwarz equipment, ensuring a robust test environment.
- Assisted the ZigBee, Thread, and BLE Application teams in developing quality customer apps, demonstrating teamwork and customer focus.
- Directed debugging efforts and coordinated communication with stack teams including ZigBee APS, ZigBee NWK, and MAC 802.15.4.

Labforge Inc.

Waterloo, Ontario

CAMERA SOFTWARE & EMBEDDED FIRMWARE DEVELOPER

May 2020 - Sept. 2021

- Programmed neural network model structures in PyTorch using publications for reference, demonstrating research and implementation skills.
- Trained models for object detection in Python/PyTorch, such as Resnet-18, Resnet-50, and EfficientDet, using both public and private datasets.
- Created private datasets for training models for object detection, showcasing initiative and data management skills.
- Designed and programmed innovative approaches to object re-identification and tracking in C/C++ and Python, achieving fast results.
- Improved inertial sensor code bases in C/C++ and managed sensor processes as Unix systemd daemons on stereo cameras.
- Collaborated with another software developer to create a reliable C/C++ state estimation engine for stereo camera tracking, demonstrating teamwork and technical collaboration. The product was presented to the Royal Canadian Air Force (posted on YouTube).
- Worked with another software developer to create robust C/C++ camera calibration and simulation software.

Northern Digital Inc.

Waterloo, Ontario

INTERN ADVANCED RESEARCHER & EMBEDDED FIRMWARE DEVELOPER

May 2018 - Sept. 2019

- Developed and programmed an embedded handheld device with multiple sensors to fuse with Polaris Vega infrared camera tracking data, showcasing innovation and technical skills.
- Collaborated with a Masters researcher to develop various data fusion algorithms (Vector, Quaternion, Pose estimation) in C++ and Python.
- Worked with another software developer to create a fast C/C++ sensor data simulation software.
- Partnered with another software developer to create a C/C++ and Python graphical viewer of real data (replayed) and simulated data.
- Developed low-level firmware drivers for virtual reality hand remotes including IMUs, ADCs, DACs, FLASH, UART, etc.

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Education

McMaster University

Hamilton, Ontario

MECHATRONICS ENGINEERING CO-OP

Sept. 2014 - April 2020

- McMaster Cumulative Grade Point Average 3.7/4.0
- McMaster Engineering Co-op Student of the Year Nominee

Projects

Neural Network Log Analysis

Waterloo, Ontario

RESEARCHER & DEVELOPER

October 2022 - May 2023

- Developed several neural network models alongside a PhD graduate to detect anomalies in wireless air transmissions and stack procedures.
- Used models such as RNN, RNN Attention-Based, and Transformer to detect anomalies in the nightly runs.

JobFunnel

Waterloo, Ontario

DEVELOPER

June - Sept. 2019

- Developed webcrawling application alongside other developers to help find and organize job postings with 1900+ stars on GitHub.
- Glassdoor and Indeed implemented CAPTCHAs shortly after the release.